

WEST

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File: USPT

Aug 27, 1985

DOCUMENT-IDENTIFIER: US 4537767 A

TITLE: Method for cleansing fluid discharging skin surfaces, wounds and mucous membranes and means for carrying out the method

Detailed Description Text (2):

Following an operation, a twenty-seven year old woman developed a large (5.times.5 cm) infected sore on her left foot. The sore discharged a nasty-smelling liquid. Bacteriological tests showed a pronounced growth of *S. aureus*. For the purpose of cleansing the sore, there was applied directly thereto a layer of dry water-insoluble particles of dextran cross-linked with epichlorohydrin (the reaction having been effected in alkaline aqueous solution, cf. British Pat. No. 974,054) having a swellability of 2.5 g of water per g of dry substance in a quantity of 1 g of sterile dry particles per 5 cm.^{sup.2} of sore surface. The average particle size was approximately 200.mu.. The sore with the cross-linked dextran particles applied thereon was covered with a sterile gauze bandage. The layer of particles was examined after 6 hours and it was found that the particles had converted to a slightly yellow gel containing discharged fluid, absorbed from the sore. The particles had no smell. The gel particles were removed from the bed of the sore by means of a plastic spatula. Remaining gel particles were washed from the sore with physiological saline solution. The treatment was repeated at 12 hours intervals. After 24 hours the sore was found to be clinically clean. No signs of infection could be clinically observed. The sore presented a healthy granulation surface at its bottom and was odourless. Cultures from the sore showed a very slight growth of *S. aureus*. After 2 days, no bacteria could be found. The test was repeated for 5 days, without any complications being observed. As the sore dried up, the quantity of particle mass required, decreased progressively. On the 5th day, the sore was found to be 4.5.times.4.5 cm in size. On the sixth day the epital defect was covered with a pork-skin graft, which healed without difficulty and within a normal time period.

Detailed Description Text (4):

An 83 year old woman had suffered for 20 years from venous circulation insufficiency in the legs. For 10 years she had an infected, painful sore on her left lower leg. The sore was 10.times.15 cm in size and discharged a nasty-smelling fluid. Previous attempts to cleanse the sore had been in vain. Surgical treatment could not be contemplated because of the poor general condition of the woman. For the purpose of cleansing the surface of the sore, there was applied directly thereto a layer of dry sterile water-insoluble particles of cross-linked dextran (cross-linked with epichlorohydrin in alkaline aqueous solution, cf. British Pat. No. 974,054) having a swellability of 5 g of water per g of dry particles and an average particle size of approximately 200.mu., in a quantity of 1.5 g per 5 cm.^{sup.2} of sore surface. After 12 hours, the gel which had formed was washed away from the area of the sore with 0.9% saline solution. The treatment was repeated at 12 hours intervals. After being thus treated for three days, the sore was clinically pure with healthy granulations and no sign of infection. The sore was odourless and much less painful than before the treatment.

Detailed Description Text (6):

A man 20 years of age, after having a tooth extracted from the lower jaw, developed

a pocket-like, mucous membrane defect, 5.times.10.times.5 mm, which showed no tendency towards spontaneous healing despite repeated and careful hygiene for two weeks. Surrounding mucous membrane was red and swollen. For the purpose of cleansing the cavity-like sore, the cavity was filled with dry sterile water-insoluble particles of carboxymethyl dextran in the form of sodium salt cross-linked with epichlorohydrin (cf. British Pat. No. 1,013,585). The total swellability per gram was more than 2 and less than 10 g of water. The swelling rate of the dry particles in physiological saline solution was 0.7 g per g/5 sec., and the average particle size was approximately 80.mu.. The gel formed in the cavity was washed away at 12 hours intervals and replaced with dry particles. After two days the cavity was found to be clean and its size reduced by half. Surrounding mucous membrane was no longer red or swollen. The sore healed spontaneously after a further two days.

Detailed Description Text (8):

A man, 50 years of age, had suffered for five years from bad circulation in the left lower leg, as a result of constrictions in the leg artery, and had suffered for one month from an infected and extremely painful sore on his left toe. The sore was one inch in diameter and emitted a discharge. Using the same technique as that described with reference to Example 1, the surface of the sore was covered with water-insoluble spherical sterile particles of diethylaminoethyl dextran, cross-linked with epichlorohydrin (cf. British Pat. No. 1,013,585). The particle size was approximately 80.mu.. The total swellability per g of the polymer was more than 2 and less than 10 g of water. The swelling rate of the dry particles in physiological sodium chloride solution was 0.4 g per g/5 sec. After three calendar days, the sore was found to be completely dry and no discharge was manifest. Neither could any signs of infection be determined, clinically. The pain experienced by the patient progressively decreased during the treatment period.

Detailed Description Text (21):

The sore had been treated for one year with saline compresses changed at close intervals and with alternating treatment with trypsin and Burows solution, without the sore becoming sufficiently clear to enable secondary suture or skin grafts to be made. For the purpose of cleaning the sore, there were used dry particles of cross-linked dextran (cross-linked with epichlorohydrin in alkaline aqueous solution, cf. British Pat. No. 974,054). The polymer product was insoluble in water but capable of undergoing swelling therein, 1 g of dry product absorbing 2.5 g of water.

Detailed Description Text (25):

A dry sterile powder in the form of spherical particles of cross-linked dextran (cross-linked with epichlorohydrin in alkaline aqueous solution, cf. British Pat. No. 974,054) was applied over the whole of the eczema area. The average particle size of the powder was approximately 400.mu.. The swellability in water was 2.5 g of water per g of dry polymer product. The sore was left uncovered during the whole of the treatment process. After 6 hours it was seen that the particles in the region of the eczema had converted to water-containing gel grains. The gel became saturated 12 hours later, whereupon it was washed away.

Detailed Description Paragraph Table (1):

(a) Polyethyleneglycol having an 14.3% average molecular weight of about 300 (Macrogol 300) (b) Polyethyleneglycol having an 28.6% average molecular weight of about 1500 (Macrogol 1540) (c) Dry particles of cross-linked dextran 57.1% having an average particle size of about 200 um and a swellability in water of 2.5 g of water per gram of dry substance (prepared according to the British Patent No. 974,054) by cross-linking dextran with epichlorohydrin in alkaline solution) 100.0% by weight

ANSWER 5 OF 28 CA COPYRIGHT 2001 ACS

AN 124:211893 CA
TI Preparation of a **dextran**-based degradable absorbent suitable for
wound healing applications
AU Chakravarthy, D.; Smith, D. J.
CS VariSeal Manufacturing Corporation, Parkman, OH, USA
SO J. Bioact. Compat. Polym. (1995), Volume Date 1995, 10(4), 313-26
CODEN: JBCPEV; ISSN: 0883-9115
DT Journal
LA English
AB Hydrolytically degradable microspheres were prepd. by crosslinking
dextran under alk. conditions with cyanogen bromide (CNBr). The
crosslinking was performed in a water-in-oil type heterophase suspension
medium. **Dextran** MWs of 500,000 and 40,000 were used for the
prepns., CNBr/**dextran**-OH mole ratios ranged from 0.021:1 to
0.21:1. The microspheres absorbed significant quantities of water (20-45
times their own wt.), and were shown to degrade in neutral buffer to sol.
and non-toxic products. Hydration and degradn. behavior varied linearly
with the ratios of CNBr to **dextran**. The phys. properties were
dependent on the mol. wts. of the dextrans used in the prepns. In
contrast to **epichlorohydrin**-crosslinked **dextran**
microspheres that are resistant to hydrolysis and only degrade
enzymically, the described microspheres degrade more rapidly by simple
hydrolysis of the iminocarbonate bonds that constitute the microspheres.
Such degradative properties are ideal in the application of the
microspheres as **wound** fillers and as components of **wound**
dressings.
CC 63-7 (Pharmaceuticals)
ST crosslinked **dextran** microsphere **wound** healing
IT Absorbents
(microspheres of crosslinked **dextran** as degradable absorbent
for **wound** dressings)
IT Crosslinking
Hydration, chemical
Hydrolysis
Wound healing
(microspheres of crosslinked **dextran** as degradable absorbent
for **wound** healing applications)
IT Medical goods
(dressings, microspheres of crosslinked **dextran** as degradable
absorbent for **wound** dressings)
IT Pharmaceutical dosage forms
(microspheres, microspheres of crosslinked **dextran** as
degradable absorbent for **wound** healing applications)
IT 506-68-3, Cyanogen bromide
RL: RCT (Reactant)
(crosslinking agent; microspheres of crosslinked **dextran** as
degradable absorbent for **wound** healing applications)
IT 9004-54-0, **Dextran**, biological studies
RL: ADV (Adverse effect, including toxicity); THU (Therapeutic use); BIOL
(Biological study); USES (Uses)
(microspheres of crosslinked **dextran** as degradable absorbent
for **wound** healing applications)